~~the two main lobes, and with reference thereto determining the entry direction of a received signal~~.

REMARKS

Applicants are pleased to see that no art rejection has been applied against claims 12-15 and 19. Although not specifically indicated by the Examiner, it appears that these claims are merely being objected to. Applicants submit that, in view of the above amendments, these claims are now in condition for allowance.

Applicants further submit that the remaining claims are allowable for reasons set forth below.

Office Action

Turning now to the Office Action in greater detail, the paragraphing of the Examiner is adopted.

Drawing

The Examiner does not comment on the drawings.

Applicants request a Notice of Draftsman's Patent Review form PTO-948 acknowledging receipt of the drawings, the drawings being formal.

Paragraphs 1-2 (Claim Rejections - Formalities)

Claims 17 and 19-23 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicants appreciate the Examiner's careful review of the claims and the various recommendations for improvement of the claim language. Applicants have carefully reviewed and revised the claims, which were previously substantially translations of the original European format claims, revising them into US format, taking care not to introduce any new subject matter.

Regarding what is being claimed in claim 12, first subparagraph, this concerns the elements of the network, and claim 12 has been revised for clarity.

Regarding claim 16, the Examiner is correct, and the error has been corrected based on paragraph 24, line 3 of the specification.

Claim 18 has been amended based on the last line of paragraph 22 of the specification.

Regarding claim 19, the "deforming" of the antenna diagram is a result of the non-symmetric driving of the individual antenna, as explained in paragraph 23 of the specification. The entry direction of the received wave or signal can then be determined by a comparison of the change of the received signal at the output of the differential channel with the signal which is received via the undeformed antenna diagram. The circuitry for producing the non-symmetric antenna diagram is explained in this paragraph.

Claim 20 has been revised based on paragraph 23 of the specification.

Entry of the amendments and withdrawal of the rejections is respectfully requested.

Paragraphs 3-6 (Claim Rejection - Anticipation)

Claims 11, 17 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent 6,266,010 (Ammar, et al.). According to the Examiner, Ammar et al. teach an antenna for transmitting and receiving and comprising antenna ports coupled to respective feed lines from a beam former wherein the beam former has switches and phase shifters for electronically switching among at least one sum beam and at least one difference beam.

Claims 11, 17 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent 5,943,011 (Acoraci et al.). According to the Examiner, Acoraci et al. disclose an antenna array that forms multiple switched beams wherein the antenna elements are coupled via a network or hybrid junctions, switches and phase shifters and wherein the antenna elements are selectively fed signals to provide the plurality of antenna patterns.

Finally, Claims 11, 17 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 3,710,390 (Kreinheder). Kreinheder is cited for disclosing a monopulse switching system including an antenna that generates a sum pattern, an azimuth difference pattern and a further elevation difference pattern wherein the antenna elements are connected via a network of hybrid junctions and a switch 50.

Applicants respectfully traverse.

To anticipate, a reference must teach every limitation of a rejected claim. The cited references do not teach the present invention.

The present invention addresses the problem of increasing demand for sector-wide coverage of large angle areas. Current systems make use of separate individual antennas serving respective sectors. Antenna characteristic is not switchable.

The present invention overcomes this problem using antenna arrays to sector-wise cover a large angle area with high frequency elements and antenna elements. Individual antennas are connected via a network of phase-shifters or hybrid junctions wherein each individual antenna array includes a sum input for selecting the individual antennas so that the antenna mean radiation pattern or directional characteristic exhibits a sum diagram and the antenna array also includes a differential input for selecting the individual antennas so that the antenna mean radiation pattern or directional characteristic exhibits a differential diagram. The antenna elements are driven and can be selected to be either in-phase or in phase-opposition relative to each other.

The antenna mean radiation pattern or directional characteristic exhibits further differential diagrams by the resulting change of the phase behavior due the selection of the individual antennas, or in that at least one of the phase shifter or hybrid junctions of the network is switched, such that the antenna mean radiation pattern or directional characteristic exhibits further differential diagrams due to the

resulting change of the phase behavior upon the selection of the individual antennas. Antenna elements are driven such that the individual elements are individually operable and can be selected to be either in-phase or in phase-opposition relative to each other.

In accordance with the present invention, in addition to the conventional sum and differential diagrams, further diagrams can be activated. Preferably, in the directional control of individual antennae elements an individual phase rotation of 0° or 180° is necessary.

Present claim 11 is thus directed to an antenna array comprising individual antennas connected via a network of phase-shifters or hybrid junctions for increasing the directional resolution and angular coverage.

Neither Ammar et al., Acoraci et al., Kreinheder teaches the features of independent claims 11 and 17; specifically, the phase shifters or hybrid junctions being switchable so that the antenna mean radiation pattern or directional characteristic can exhibit further different diagrams by the resulting change of the phase behavior due to the selection of the individual elements.

These features are neither present in or obvious over the references taken alone or in combination.

Accordingly, withdrawal of the rejection is respectfully requested.

Paragraphs 8-9 (Claim Rejection - 35 USC §103)

Claims 16 and 20 are rejected under 35 U.S.C. 103(a) as being obvious over any one of Ammar et al., Acoraci et al., or Kreinheder in view of either US Statutory Invention Registration (Masak et al.) or (Pierrot) US Patent No. 3,594,811).

Claims 16 and 20 represent a preferred embodiment of the invention, wherein by addition of one further antenna it becomes possible to determine the direction of receipt (left or right) of a received signal.

The references Masak and Pierrot cited against these claims are not relevant, since these references describe systems for cancellation of side lobes. Herein at least one additional antenna element is provided in order to make it possible to determine whether the received signal is being received from the direction of the main lobe of the antenna diagram, or whether the received direction lie in one of the directions of the side lobes. A signal received from one of the directions of the side lobes is to be suppressed; an examination as to whether this signal is received from a right or a left lobe is of no interest and is not carried out.

Further, Applicants respectfully submit that these dependent claims are allowable by virtue of their dependency from allowable base claims.

Accordingly, withdrawal of the rejection is respectfully requested.

Paragraph 10

The Examiner states that other prior art made of record is considered pertinent to applicant's disclosure. Although the Examiner has not applied this prior art against the present claims, Applicants have reviewed the references and have concluded that these references are not relevant to the present invention.

Early issuance of the Notice of Allowance is respectfully requested.

Respectfully submitted,

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Date: **May 30, 2003**

CERTIFICATE OF MAILING AND AUTHORIZATION TO CHARGE

I hereby certify that the foregoing AMENDMENT A for U.S. Application No. 09/979,564 filed November 14, 2001, were deposited in first class U.S. mail, postage prepaid, **Mail Stop:** Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on **May 30, 2003**.

The Commissioner is hereby authorized to charge any additional fees which may be required at any time during the prosecution of this application without specific authorization, or credit any overpayment, to Deposit Account No. 16-0877.

Stephan A. Pendorf